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(54) ON-VEHICLE BODY-DETECTING SENSOR AND INTERLOCKING APPARATUS FOR THE DETECTION

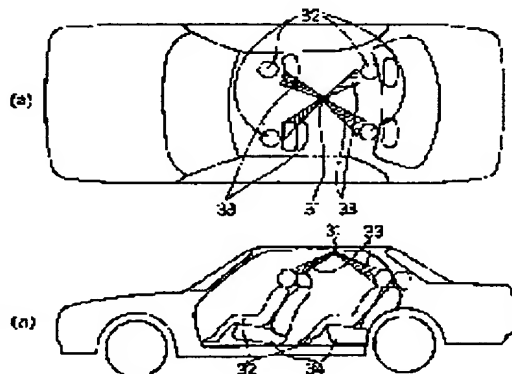
(57)Abstract:

PURPOSE: To provide a sensor interlocking apparatus in which an indirect damage, etc., due to an air bag can be avoided.

CONSTITUTION: A pyroelectric infrared sensor 31 is installed on a ceiling of a vehicle at an intermediate between a front seat and a rear seat of the vehicle to detect a human body 32 existing in an infrared detecting region 33. Since the sensor 31 is installed just at an equal distance from the bodies sitting on the respective seats, infrared rays emitted from the

bodies are accurately condensed to light receiving electrodes one by one. Accordingly, four bodies can be accurately detected by the four light receiving electrodes. In the case of a collision of the vehicle, the sensor 31 is

interlocked to air bags installed at the respective seats to operate only the bag of the seat in which the body is detected by the sensor 31. Therefore, since the bag of the seat in which no body sits is not expanded, an abrupt rise of the atmospheric pressure in the vehicle can be avoided, and there is no anxiety of damaging driver's eardrums.



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CLAIMS

[Claim(s)]

[Claim 1] vehicle loading characterized by equipping the infrared sensor with which two or more light sensing portions were prepared, and its infrared sensor with a condensing means to condense infrared radiation, and the condensing means condensing to one person's seat so that the adjoining piece or two or more light sensing portions in said infrared sensor may correspond -- a factotum -- a body detection sensor.

[Claim 2] vehicle loading according to claim 1 which a condensing means is a wide angle lens and is characterized by the ability to detect the body in the train collectively, without said sensor rotating -- a factotum -- a body detection sensor.

[Claim 3] vehicle loading according to claim 2 characterized by the wide angle lens consisting of a silicon ingredient -- a factotum -- a body detection sensor.

[Claim 4] vehicle loading according to claim 1 which a condensing means is a reflective mirror and is characterized by the ability to detect the body in the train collectively, without said infrared sensor rotating -- a factotum -- a body detection sensor.

[Claim 5] vehicle loading according to claim 4 characterized by the reflective mirror consisting of a condenser lens of a concave mirror -- a factotum -- a body detection sensor.

[Claim 6] vehicle loading claims 1 and 2 characterized by being installed in the location of either middle head lining of a driver's seat and a passenger seat near the room mirror in the train, or middle head lining of anterior part and a backseat, or given in four -- a factotum -- a body detection sensor.

[Claim 7] vehicle loading claims 1 and 2 characterized by having the chopping means which an infrared sensor is a pyro infrared sensor and can intercept intermittently the infrared radiation which carries out incidence to the pyro infrared sensor, or given in four -- a factotum -- a body detection sensor.

[Claim 8] The body detection sensor for vehicle loading according to claim 7 characterized by what the body in the train is detected for by making the signal of the multiple times by the chopping means integrate.

[Claim 9] vehicle loading claims 1 and 2 characterized by taking spacing for several minutes in sensing of body detection, and performing body detection intermittently, or given in four -- a factotum -- a body detection sensor.

[Claim 10] the prime mover of vehicles, such as an automobile, starts -- one vehicle loading of claims 1-9 -- a factotum -- the body detection interlocking device characterized by for a body detection sensor working, detecting the body which is on the vehicle, taking spacing for several minutes in subsequent body detection, and performing sensing intermittently.

[Claim 11] The body detection interlocking device characterized by having the body detection sensor which detects whether people exist in the position of the seat of vehicles, such as an automobile, and the device which works based on the output from the body detection sensor.

[Claim 12] A device is a body detection interlocking device according to claim 11 which is an airbag system and is characterized by working only the air bag in the location of the seat where the body exists based on the output from said body detection sensor in the case of the collision of a vehicle.

[Claim 13] A device is a body detection interlocking device according to claim 11 which is an audio system and is characterized by the sound effect doubled with the taking-a-seat location operating.

[Claim 14] A device is a body detection interlocking device according to claim 11 characterized by the air-conditioning effectiveness which is a HVAC system and was doubled with the taking-a-seat location operating.

[Claim 15] The body detection interlocking device according to claim 11 with which a body detection sensor is characterized by being in any of claims 1-9.

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DETAILED DESCRIPTION

[Detailed Description of the Invention]

[0001]

[Industrial Application] vehicle loading whose this invention detects the body in the train -- a factotum -- it is related with a body detection sensor and the body detection interlocking device using it.

[0002]

[Description of the Prior Art] Recently, the automobile is considered in the number many and air bag equipment is expected [in / especially / the safety aspect in case of an automobile accident]. All the air bags in front of a seat operate and expand in that instant when the automobile collided, and this air bag equipment plays the role of a cushion to those whose air bag of that that expanded is in an automatic in the car one, and can prevent now beforehand the injury which will be undertaken by the impact immediately after accident.

[0003] Moreover, in the amenity side of an automobile, there are some which are advertizing the amenity in the inside of a vehicle strongly by introducing an audio, an air conditioner, etc. into an automobile.

[0004]

[Problem(s) to be Solved by the Invention] However, also when only a driver gets on and people are not sitting on the passenger seat for example, in the case of the automobile by which the driver's seat and the passenger seat are equipped with the air bag, all air bags operate at the time of the collision of an automobile. Consequently, although the air bag of a driver's seat is existence of a driver and it does not expand extensively, the air bag of a passenger seat will expand completely. Therefore, since the volume which expands in the instant of an air bag becomes large too much, an atmospheric pressure in the car rises rapidly, and there is a problem of getting injured indirectly by the air bag -- the eardrum of those who are in in the car being torn.

[0005] Moreover, since the air bag of a passenger seat has also expanded to return the air bag to which it expanded after the collision, all air bags must be returned and many costs are needed. That is, there was a problem that repair cost became high.

[0006] Then, this invention aims at offering the body detection interlocking device equipped with the device which works based on the output from the body

detection sensor and its body detection sensor for vehicle loading as for which repair cost is made to the minimum to return the air bag which avoided the indirect injury by the air bag, and expanded after the collision in view of the technical problem of above-mentioned conventional air bag equipment.

[0007]

[Means for Solving the Problem] vehicle loading which this invention equips the infrared sensor with which two or more light sensing portions were prepared, and its infrared sensor with a condensing means to condense infrared radiation, and the condensing means condenses so that the piece or two or more light sensing portions which are adjoined in said infrared sensor to one person's seat may correspond in order to solve an above-mentioned technical problem -- a factotum -- it is a body detection sensor.

[0008] Moreover, this invention uses wide angle lenses, such as a silicon ingredient system, for said condensing means, and without said infrared sensor rotating, the body in the train can be put in block, and it can detect them.

[0009] Furthermore, this invention is characterized by the ability to detect the body in the train collectively, without said condensing means' consisting of reflective mirrors, such as a concave mirror, and said infrared sensor rotating.

[0010] Moreover, this invention is installed in the place where said infrared sensor was located in middle head lining of a driver's seat and a passenger seat near the room mirror in the train, or middle head lining of anterior part and a backseat.

[0011] Moreover, said infrared sensor is a pyro infrared sensor, and this invention is equipped with the chopping means which can intercept intermittently the infrared radiation which carries out incidence to said sensor.

[0012] Furthermore, this invention is characterized by making the signal of multiple times integrate and performing body detection in the train with said chopping means.

[0013] Moreover, in sensing of body detection, this invention takes spacing for several minutes, and performs body detection intermittently.

[0014] moreover, the thing for which the engine of a vehicle puts the body detection interlocking device of this invention into operation -- said vehicle loading -- a factotum -- a body detection sensor works, the body which is on the vehicle is detected, spacing for several minutes is taken in subsequent body detection, and sensing is performed intermittently.

[0015] Moreover, the body detection interlocking device of this invention makes a judgment from the body detection sensor which detects whether people are sitting on the predetermined location, and its detection, and is equipped with the body detection interlocking device which works by interlocking the device of only a required part.

[0016] Moreover, although the body detection sensor in the above-mentioned body detection interlocking device mentioned this invention above, it is a body detection interlocking device which it is in any.

[0017] moreover, this invention -- said vehicle loading -- a factotum -- the body detection sensor and the airbag system currently installed in the train are connected, and it is the body detection interlocking device characterized by only the air bag of the seat where the body is detected by said body detection sensor

working at the time of a collision.

[0018] furthermore, this invention -- said vehicle loading -- a factotum -- the body detection sensor and the audio system are connected and it is the body detection interlocking device with which an effective sound doubled with the taking-a-seat location works.

[0019] moreover, this invention -- said vehicle loading -- a factotum -- the body detection sensor and the HVAC system are connected and it is the body detection interlocking device with which effective air-conditioning doubled with the taking-a-seat location works.

[0020]

[Function] this invention -- said vehicle loading carried out -- a factotum -- a body detection sensor can detect collectively the body which is sitting on the seat of a vehicle immediately easily. moreover, vehicle loading -- a factotum -- a body detection sensor and its vehicle loading -- a factotum -- control of various systems is enabled by combining various devices which work from detection by the body detection sensor with the body detection interlocking device which carries out a certain decision and control.

[0021] As for the body detection sensor for vehicle loading of this invention, the piece or plurality of a light sensing portion adjoined in said infrared sensor corresponds to one person's seat. And a condensing means to condense infrared radiation to said infrared sensor condenses infrared radiation to one person's body which is an infrared generation source corresponding to the piece or plurality of a light sensing portion adjoined in said infrared sensor.

[0022] A wide angle lens is used for said condensing means, and the body in the train is detected collectively, without said infrared sensor rotating.

[0023] Said condensing means consists of a reflective mirror, and the body in the train is detected collectively, without said infrared sensor rotating.

[0024] Said infrared sensor is a pyro infrared sensor, the pyro infrared sensor has a chopping means, and the chopping means intercepts intermittently the infrared radiation which carries out incidence.

[0025] Body detection is performed by making the signal of multiple times detected with said chopping means integrate.

[0026] In sensing of body detection of the body detection sensor for vehicle loading, spacing for several minutes is taken and body detection is performed intermittently.

[0027] a prime mover starts by vehicles, such as an automobile, -- vehicle loading -- a factotum -- a body detection sensor works, the body which is on the vehicle is detected, spacing for several minutes is taken in subsequent body detection, and sensing is performed intermittently.

[0028] As for the body detection interlocking device of this invention, only the air bag of the seat where people are sitting down at the time of the collision of an automobile operates. And the rapid rise of an atmospheric pressure in the car is suppressed, and the insurance of those who are in in the car is fully kept.

[0029] Moreover, the body detection interlocking device of this invention provides those who have ridden with the optimal space by using the sound and the air-conditioning effectiveness which were doubled with the taking-a-seat location.

[0030]

[Example] Hereafter, the example of this invention is explained with reference to a drawing.

[0031] vehicle loading of the 1st example of this invention -- a factotum -- the actuation is explained to be a body detection sensor, referring to a drawing.

[0032] There is an infrared sensor etc. in the body detection sensor used for the equipment which detects an infrared generation source. Although two kinds of type-of-fever sensors which use the quantum mold sensor which regards infrared radiation as a photon, and physical-properties change of the component produced as a result of the heat operation to which infrared radiation is absorbed as an electromagnetic wave and the temperature of a component rises as an infrared sensor are known, since cooling by liquid nitrogen etc. is usually required about the former, generally the type-of-fever sensor is used. Also in the type-of-fever sensor, [else], since sensibility is high, the pyro infrared sensor fits infrared generation source detection. However, fundamentally, since a pyro infrared sensor is what detects change of infrared radiation, when it is going to detect the stationary infrared generation source, it is necessary to devise it so that infrared radiation may carry out incidence to a sensor light sensing portion intermittently by a certain approach. Usually, it has realized that infrared radiation carries out intermittence incidence (chopping) to a sensor light sensing portion by rotating or vibrating choppers, such as a disk with a slit, and a plate.

[0033] Drawing 1 shows the schematic diagram of the pyro infrared sensor used in one example of this invention. The infrared gobo 12 and the silicon infrared transparency lens 13 for condensing infrared radiation to a pyroelectric element 11 were formed in the front face of a pyroelectric element 11 and this pyroelectric element 11 as an infrared array sensor of the pyroelectricity which prepared two or more light sensing portions in the shape of a matrix, and the chopper 14 which intercepts intermittently the infrared radiation 17 which carries out incidence to a lens 13 was further formed in the front face of a lens. It connects with a stepping motor 16 mechanically, and this chopper 14 can be rotated now.

[0034] The schematic diagram of the electrode pattern by the side of light-receiving of a part of pyroelectric element 11 and opposite is shown in drawing 2 (a) and (b). There, the form where four compensation electrodes 23 have been respectively arranged on the outskirts is carried out to four light-receiving electrodes 21, and a component can be easily formed in it.

[0035] Since the pyro infrared sensor shown by drawing 1 consists of a pyroelectric element, an infrared transparency wide angle lens, and a chopper, it can miniaturize and can produce in cost and at a low price, and it is reliable and it is possible to detect the body with high precision.

[0036] The mimetic diagrams showing the situation of the body detection when installing this body detection sensor in the anterior part of an automobile and the middle of a backseat are drawing 3 (a) and (b), and drawing 3 (a) is drawing at the time of seeing drawing 3 (b) from width, when it sees from a top.

[0037] Next, actuation of the 1st example of this invention is explained. An infrared sensor 31 is installed in head lining of a vehicle, and it detects that the

body 32 exists in the infrared detection field 33. Since this infrared sensor 31 is exactly installed in the equal distance from the body sitting on each seat, the light-receiving electrode 21 in which the infrared radiation emitted from the everybody object was shown by drawing 2 can be respectively condensed correctly by each. Drawing 4 is the mimetic diagram having shown the situation of infrared light-receiving at this time. With the infrared transparency wide angle lens 45, the infrared radiation 47 which came out of one person's body 48 sitting on the seat of a vehicle is in the condition by which the focus was carried out correctly, and can be condensed to one of the light-receiving electrodes 41 on a pyroelectric element 42. Also in an everybody object sitting on each of other seat, since a condensing condition like drawing 4 is possible, four persons' body can be correctly detected to four light-receiving electrodes, and the taking-a-seat situation of a seat can be known.

[0038] Moreover, by making what was detected according to the chopping device of this pyro infrared sensor 31 succeeding the time of detecting the body dozens times integrate, a S/N ratio can be raised and body detection can be performed with high precision more correctly. Furthermore, after making it integrate and carrying out continuation detection, power consumption can be lessened by setting spacing for several minutes and performing body detection intermittently. Moreover, since own generation of heat of a chopper can be controlled, the accuracy of body detection increases.

[0039] As mentioned above, according to this example, a man sitting on the seat can be collectively detected with high degree of accuracy and high-reliability easily by installing a wide angle lens and the pyro infrared sensor using a chopper in the location of the center of an automobile in the car by the cover half.

[0040] In addition, in this example, although the pyro infrared sensor was used as a body detection sensor, an electromotive force mold infrared sensor, quantum mold infrared sensors, etc. other than pyroelectricity, such as a thermopile, may be used. Moreover, chalcogens glass systems other than silicon etc. are sufficient as an infrared transparency lens. Or you may be body detection sensors other than an infrared sensor.

[0041] next, vehicle loading of the 2nd example of this invention -- a factotum -- the actuation is explained to be a body detection sensor, referring to a drawing.

[0042] vehicle loading [in / in drawing 5 / the 2nd example of this invention] -- a factotum -- it is the mimetic diagram showing the situation of the body detection at the time of using a body detection sensor. Drawing 5 (a) is drawing at the time of seeing drawing 5 (b) from width, when it sees from a top. An infrared sensor 51 can be installed in the location of a room mirror in the train, and it can detect that the body 52 is in the infrared detection field 53. What is necessary is just the place it becomes impossible for a hind man to detect with the head of a man sitting on anterior part as a location of an infrared sensor 51 as shown in drawing 5 (a) and (b). Next, actuation of the 2nd example of this invention is explained.

[0043] In this example, since an infrared sensor 51 is ahead [in the train], the condensing conditions of the infrared radiation respectively emitted by the man sitting on anterior part and a backseat differ. When the focus suits the man of a

front seat, the man of a backseat is in the defocusing condition which the focus does not suit. Drawing 6 is the mimetic diagram having shown the situation of infrared light-receiving from a man sitting on the backseat at this time. With the infrared transparency wide angle lens 65, the infrared radiation 67 which came out of one person's body 68 sitting on the backseat of a vehicle is condensed in the condition of having been defocused by two light-receiving electrodes 61 on a pyroelectric element 62. In addition, the situation of infrared light-receiving from those who are sitting on the front seat in this case is the same as that of drawing 4. Moreover, when the focus suits the man of a backseat conversely, the man of a front seat can say that it is in the defocusing condition which the focus does not suit. The situation of infrared condensing emitted by those who are sitting on the front seat also in that case will be in a DIHOKASU condition like drawing 6. Therefore, since light is received with two light-receiving electrodes 61, sufficient signal processing is possible for the defocused infrared radiation. Therefore, by using six light-receiving electrodes after all, four persons' body in the train can be detected correctly, and the taking-a-seat situation of a seat can be known.

[0044] Moreover, it is also possible to change the magnitude of the light-receiving electrode 61, to transpose these two light-receiving electrodes 61 that are defocused and are receiving light to one big light-receiving electrode, and to detect one person's body. The schematic diagram of the electrode pattern by the side of light-receiving of the pyroelectric element at this time and opposite is shown in drawing 7. Two light-receiving electrodes 71 for receiving defocusing infrared radiation are large, and can receive correctly the infrared radiation defocused now altogether. Moreover, two light-receiving electrodes 71 for receiving the infrared radiation which remains and by which the focus was carried out are small light-receiving electrodes. Moreover, it has the form where four compensation electrodes 73 have been respectively arranged on the outskirts, to these four light-receiving electrodes 71, and a component can be formed easily.

[0045] Moreover, by making what was detected according to the chopping device of this pyro infrared sensor 51 succeeding the time of detecting the body dozens times integrate, a S/N ratio can be raised and body detection can be performed more correctly. Furthermore, after making it integrate and carrying out continuation detection, power consumption can be lessened by setting spacing for several minutes and performing body detection intermittently. Moreover, since own generation of heat of a chopper can be controlled, the accuracy of body detection increases.

[0046] As mentioned above, according to this example, a man sitting on the seat can be collectively detected with high degree of accuracy and high-reliability easily by installing the pyro infrared sensor compact and cheap in cost using a wide angle lens and a chopper in the location of the room mirror of an automobile by the cover half.

[0047] In addition, in this example, although the installation part of a body detection sensor was installed in the location of the room mirror of an automobile, anywhere sitting on the backseat in the limitation of the range and middle head lining of a driver's seat and a passenger seat which people can detect is sufficient as it. Moreover, although the pyro infrared sensor was used as a body detection

sensor, an electromotive force mold infrared sensor, quantum mold infrared sensors, etc. other than pyroelectricity, such as a thermopile, may be used. Of course, sensors other than an infrared sensor may be used.

[0048] Moreover, in this example, although two light-receiving electrodes have detected one person's body, in short, three or more etc. may detect one person's body with two or more light-receiving electrodes, and the magnitude of a light-receiving electrode may be changed and the light-receiving electrode which packed two or more light-receiving electrodes into one [big] may detect one person's body.

[0049] next, vehicle loading of the 3rd example of this invention -- a factotum -- the actuation is explained to be a body detection sensor, referring to a drawing.

[0050] Drawing 8 shows the schematic diagram of the pyro infrared sensor used in the 3rd example of this invention. A concave mirror 82 is formed in the front face of a pyroelectric element 81 and this pyroelectric element as a reflecting mirror as an infrared array sensor of the pyroelectricity which prepared two or more light-receiving electrodes in the shape of a matrix, and it is made to condense on a pyroelectric element by reflecting infrared radiation 83, and carries out as [detect / the infrared radiation of the field of the high range]. Of course, the chopper which intercepts intermittently the infrared radiation which carries out incidence to a pyroelectric element is formed. This body detection sensor was installed in the anterior part of an automobile, and the middle of a backseat like drawing 3 .

[0051] If actuation of the 3rd example of this invention is explained using drawing 3 and drawing 8 , the pyro infrared sensor shown in drawing 8 can be installed in head lining of a vehicle as an infrared sensor 31, and it can detect whether the body 32 exists in the infrared detection field 33. With a concave mirror 82, the infrared radiation which came out of one person's body sitting on the seat of a vehicle since the distance from an infrared sensor 31 to an everybody object was the equal distance mostly can be condensed to one of the light-receiving electrodes on a pyroelectric element, where a focus is carried out correctly. Therefore, in an everybody object sitting on each seat, since the condensing condition by which the focus was carried out is possible, four persons' body can be correctly detected to four light-receiving electrodes, and the taking-a-seat situation of a seat can be known.

[0052] Moreover, by making what was detected according to the chopping device of this pyro infrared sensor succeeding the time of detecting the body dozens times integrate, a S/N ratio can be raised and body detection can be performed with high precision more correctly.

[0053] Furthermore, after making it integrate and carrying out continuation detection, power consumption can be lessened by setting spacing for several minutes and performing body detection intermittently. Moreover, since own generation of heat of a chopper can be controlled, the accuracy of body detection increases.

[0054] As mentioned above, according to this example, a man sitting on the seat can be collectively detected with high degree of accuracy and high-reliability easily by installing a reflecting mirror and the pyro infrared sensor using a chopper

in the location of the center of an automobile in the car by the cover half.

[0055] In addition, in this example, although the pyro infrared sensor was used as a body detection sensor, an electromotive force mold infrared sensor, quantum mold infrared sensors, etc. other than pyroelectricity, such as a thermopile, may be used. Of course, sensors other than infrared radiation may be used.

[0056] Next, the body detection interlocking device of the 4th example of this invention is explained.

[0057] in the range which can detect a man sitting on the predetermined location of all the seats of the anterior part of an automobile, and a posterior part -- the part of arbitration -- vehicle loading -- a factotum -- the body detection sensor is installed. The power source of the body detection sensor for vehicle loading is interlocked with starting and a halt of the prime mover of an automobile, i.e., an engine, and carries out the enter end. Therefore, only while the engine is operating, said sensor works.

[0058] a prime mover starts -- vehicle loading -- a factotum -- a body detection sensor begins to work, spacing for several minutes is taken in the body detection after detecting the body which is on the vehicle, and sensing is performed intermittently. if a prime mover stops -- vehicle loading -- a factotum -- work of a body detection sensor is also stopped.

[0059] thus, the body detection interlocking device of this example -- systematic -- very much -- simple -- easy -- low cost -- ** -- it is possible to perform body detection correctly and a safe vehicle can be offered.

[0060] Next, the body detection interlocking device of the 5th example of this invention is explained.

[0061] As drawing 3 of said 1st example showed, the infrared sensor 31 is installed in the center of an automobile, and the infrared sensor 31 and each air bag currently installed in each seat of an automobile are connected.

[0062] During automobile operation, the existence of body existence is detected about each seat which includes a driver's seat with an infrared sensor 31, and the near value of body temperature is made into the temperature value of criteria as criteria which judge the existence of the body existence. In the case of the collision of an automobile, in the body detection field 33, change of the infrared radiation by which the infrared sensor 31 is emitted from the body detects, and only the air bag of the seat judged that there is existence of the body is operated. Therefore, since people are in the predetermined location of the detected seat at this time, that man can fully receive the effectiveness as a cushion of the air bag which operated. Moreover, since the air bag of the seat where the body does not exist does not expand, the rapid rise of an atmospheric pressure in the car can be controlled, and the insurance of those who are in in the car can be kept enough. Moreover, since the air bag of the seat where the body does not exist does not expand, necessary minimum is sufficient also as the costs for returning an air bag, and repair cost can also make them low. In addition, when the mean temperature in the train becomes about 35 degrees C near body temperature, in a type-of-fever infrared sensor like pyroelectricity, decision actuation in which people are sitting on all seats is carried out. That is, it considers protecting the body preferentially from the impact caused by the time of the collision of a vehicle, and

has the failsafe function to operate all air bags.

[0063] Thus, also systematically the body detection interlocking device of this example is very simple, easy by using this body detection interlocking device, can carry out exact high body detection of ***** to low cost, and can offer a safe vehicle.

[0064] Next, the body detection interlocking device of the 6th example of this invention is explained.

[0065] As drawing 5 of said 2nd example showed, an infrared sensor 51 is installed ahead of an automobile, and the optimal sound effect which set this infrared sensor and the audio facility installed in an automobile by the taking-a-seat location with the bond and the infrared sensor is worked.

[0066] By carrying out like this, the optimal space can be made only on the outskirts of people sitting down, and a vehicle can be driven safely relaxedly. Furthermore, since the power consumption energy of an automobile can be controlled, it becomes possible to improve fuel consumption.

[0067] Thus, also systematically the body detection interlocking device of this example is very simple, easy by using this body detection interlocking device, can carry out exact high body detection of ***** to low cost, and can offer a comfortable vehicle.

[0068] Next, the body detection interlocking device of the 7th example of this invention is explained.

[0069] As drawing 5 of said 2nd example showed, an infrared sensor 51 is installed ahead of an automobile, and the optimal air-conditioning effectiveness which set this infrared sensor and the air-conditioner facility installed in an automobile by the taking-a-seat location with the bond and the infrared sensor is worked.

[0070] By carrying out like this, the optimal space can be made only on the outskirts of people sitting down, and a vehicle can be driven safely relaxedly. Furthermore, the power consumption energy of an automobile can be controlled, consequently fuel consumption can be improved.

[0071] Thus, also systematically the body detection interlocking device of the example mentioned above is very simple, easy by using this body detection interlocking device, can carry out exact high body detection of ***** to low cost, and can offer a safe and comfortable vehicle.

[0072] Although what kind of thing may be used as a body detection sensor combined with the body detection interlocking device mentioned above as long as the body is detectable, it is cheap compactly and in cost and especially the infrared sensor of reliable pyroelectricity is good. It is possible to fix without making the pyro infrared sensor rotate a sensor by establishing a wide angle lens or a concave mirror reflective lens, and a chopping means, to bundle up with high precision intermittently, and to detect the body in the train, the power consumption energy of an automobile can be controlled and it is still more possible to improve fuel consumption.

[0073]

[Effect of the Invention] clear from the above explanation -- as -- this invention -- vehicle loading -- a factotum -- a body detection sensor can detect collectively the body which is sitting on the seat of a vehicle immediately easily.

[0074] It has the effectiveness that it is strong and reliable body detection can be correctly performed also to the vibration at the time of transit of an automobile, by using a pyro infrared sensor as a body detection sensor especially.

[0075] Moreover, it is possible by using a wide angle lens and a reflecting mirror as a condensing means to carry out package detection of the body in the train easily.

[0076] Moreover, by using a chopping means, a pyro infrared sensor is exact and reliable body detection is possible for it.

[0077] Moreover, in sensing of body detection of the body detection sensor for vehicle loading, spacing for several minutes is taken and an automobile etc. can control the power energy consumed by the vehicle by performing body detection intermittently. Moreover, it becomes possible to control and the accuracy of body detection increases generation of heat caused by the chopper. Moreover, when these descriptions use this body detection sensor from an automobile, it leads also to the effectiveness which improves fuel consumption.

[0078] moreover, the thing for which a prime mover puts this invention into operation -- vehicle loading -- a factotum -- since a body detection sensor begins to work, the body which is on the vehicle is detected, spacing for several minutes is taken in subsequent body detection and sensing is performed intermittently, the power consumption of said sensor becomes low sharply as a whole. Moreover, since the burden of the dc-battery of an automobile can be lessened, it leads also to the effectiveness which improves fuel consumption.

[0079] Moreover, necessary minimum is sufficient also as the costs for only the air bag of the seat where people are sitting down at the time of the collision of an automobile being able to work, and this invention being able to control the rapid rise of an atmospheric pressure automatic in the car, and keeping enough the insurance of those who are in an automatic in the car one, and returning an air bag, and repair cost has the effectiveness that it can do low.

[0080] Moreover, the optimal space is effectively made by interlocking an infrared sensor and devices, such as an audio and an air-conditioner, by [with which a focus is doubled in the direction where people are sitting down] using control of device actuation, such as sound and air-conditioning, like. By this thing, a driver can realize the optimal space which relaxes and can drive an automobile safely.

[0081] Thus, although this body detection interlocking device is very simple systematically, it is possible to carry out exact body detection to low cost easily.

[0082] Therefore, by using this invention, easily and with high precision, body detection with high ***** and safety can be performed, and it can contribute to manufacture of a safe and comfortable automobile greatly.

[Translation done.]

* NOTICES *

JPO and NCIP are not responsible for any damages caused by the use of this translation.

1. This document has been translated by computer. So the translation may not reflect the original precisely.

2. **** shows the word which can not be translated.

3. In the drawings, any words are not translated.

DESCRIPTION OF DRAWINGS

[Brief Description of the Drawings]

[Drawing 1] vehicle loading of one example of this invention -- a factotum -- it is the outline perspective view of the concrete pyro infrared sensor in a body detection sensor.

[Drawing 2] It is the outline top view showing the electrode pattern by the side of (a) light-receiving of the pyroelectric element in the 1st example of this invention, and (b) opposite.

[Drawing 3] vehicle loading in the 1st, 3rd, and 5th example of this invention -- a factotum -- it is the mimetic diagram showing the situation of the body detection at the time of using a body detection sensor.

[Drawing 4] vehicle loading of the 1st, 3rd, and 5th example of this invention -- a factotum -- it is the mimetic diagram showing the situation of infrared light-receiving in a body detection sensor.

[Drawing 5] vehicle loading in the 2nd example of this invention -- a factotum -- it is the mimetic diagram showing the situation of the body detection at the time of using a body detection sensor.

[Drawing 6] vehicle loading of the 2nd example of this invention -- a factotum -- it is the ** type side elevation showing the situation of infrared light-receiving in a body detection sensor.

[Drawing 7] It is the outline top view showing the electrode pattern by the side of (a) light-receiving of the pyroelectric element in the 2nd example of this invention, and (b) opposite.

[Drawing 8] It is the outline sectional view showing the pyro infrared sensor in the 3rd example of this invention.

[Description of Notations]

11, 42, 62, and 81 Pyroelectric element

12, 44, 64 Infrared gobo

13, 45, 65 Infrared transparency lens

14, 46, 66 Chopper

15 Chopper Shaft

16 Stepping Motor

17, 47, 67, and 83 Infrared radiation

21 71 Light-receiving electrode

22 72 Light-receiving electrode lead section
23 73 Compensation electrode
24 74 Compensation electrode lead section
31 51 Infrared sensor
32, 48, 52, and 68 Body
33 53 Infrared detection field
34, 49, 54, and 69 Seat
41 61 Light-receiving electrode
25, 43, 63, and 75 Counterelectrode
82 Concave Mirror

[Translation done.]

* NOTICES *

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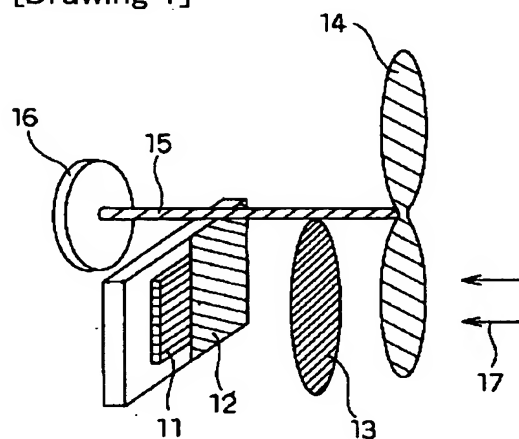
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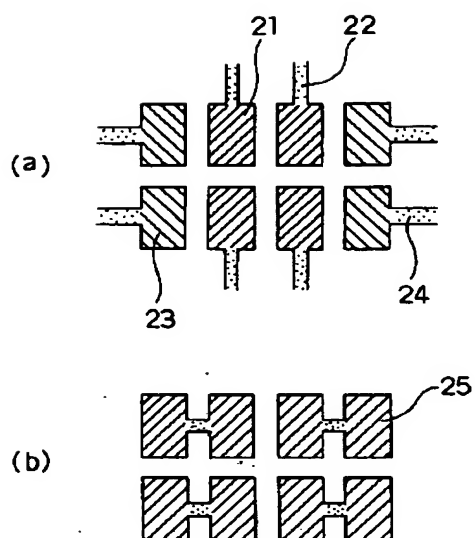
DRAWINGS

[Drawing 1]



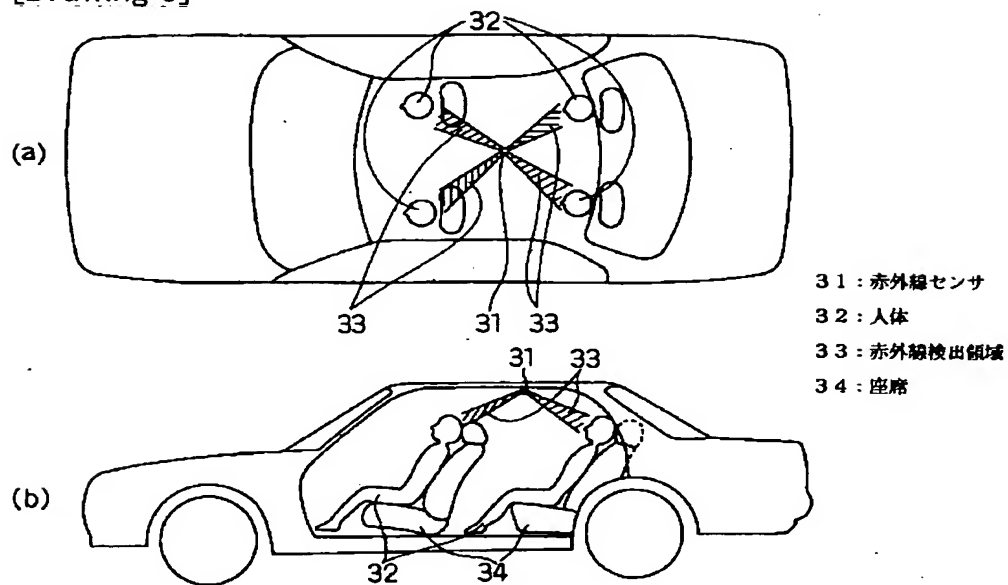
- 11 : 焦電素子
- 12 : 赤外線遮光板
- 13 : 赤外線透過レンズ
- 14 : チョッパー
- 15 : チョッパーシャフト
- 16 : ステッピングモーター
- 17 : 赤外線

[Drawing 2]

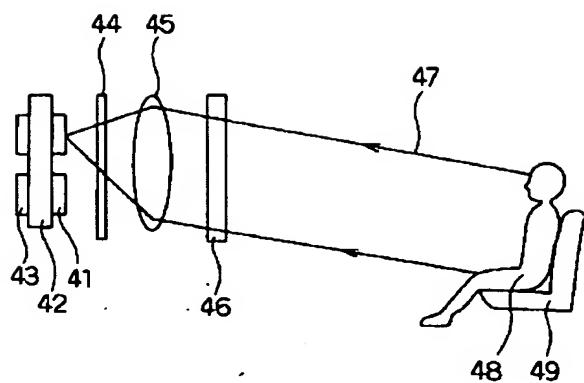


- 21 : 受光電極
 22 : 受光電極リード部
 23 : 補償電極
 24 : 補償電極リード部
 25 : 対向電極

[Drawing 3]

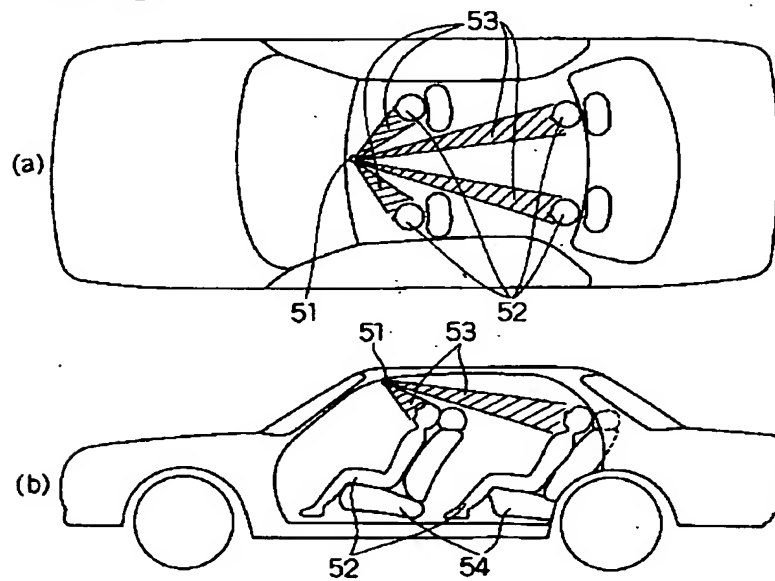


[Drawing 4]



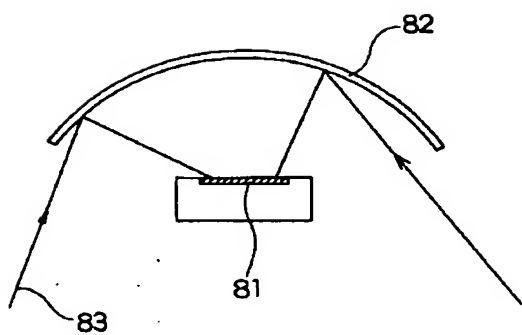
- 41 : 受光電極
- 42 : 熱電素子
- 43 : 対向電極
- 44 : 赤外線遮光板
- 45 : 赤外線透過レンズ
- 46 : チョッパー
- 47 : 赤外線
- 48 : 人体
- 49 : 座席

[Drawing 5]



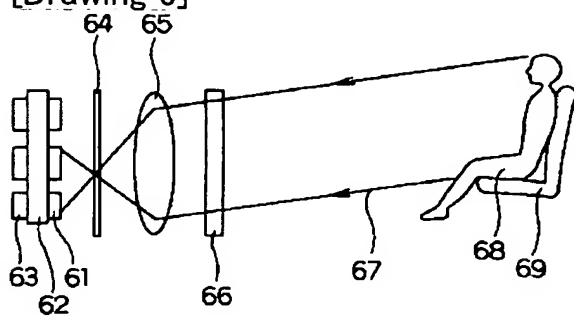
- 51 : 赤外線センサ
- 52 : 人体
- 53 : 赤外線検出領域
- 54 : 座席

[Drawing 8]



- 81 : 熱電素子
- 82 : 凹面鏡
- 83 : 赤外線

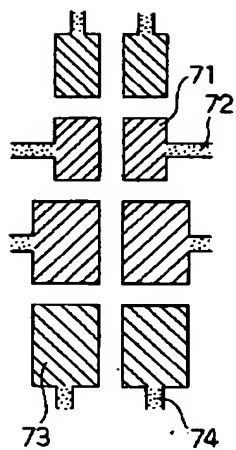
[Drawing 6]



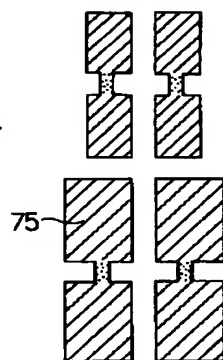
- 61 : 受光電極
- 62 : 熱電素子
- 63 : 対向電極
- 64 : 赤外線遮光板
- 65 : 赤外線透過レンズ
- 66 : チョッパー
- 67 : 赤外線
- 68 : 人体
- 69 : 座席

[Drawing 7]

(a)



(b)



71 : 受光電極

72 : 受光電極リード部

73 : 補償電極

74 : 補償電極リード部

75 : 対向電極

[Translation done.]